

UNITED STATES PATENT AND TRADEMARK OFFICE  
**CERTIFICATE OF CORRECTION**

PATENT NO. : 6,866,024 B2  
 APPLICATION NO. : 10/092031  
 DATED : March 15, 2005  
 INVENTOR(S) : Rizzoni et al.

Page 1 of 5

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

In column 4, lines 46-54,  
 please delete

“  $a_0 \Sigma 1 + a_1 \Sigma x_{1,k} + a_2 \Sigma x_{2,k} + a_3 \Sigma x_{3,k} + a_4 \Sigma x_{4,k} = \Sigma y_{true,k}$

$a_0 \Sigma x_{1,k} + a_1 \Sigma x_{1,k}^2 + a_2 \Sigma x_{1,k} x_{2,k} + a_3 \Sigma x_{1,k} x_{3,k} + a_4 \Sigma x_{1,k} x_{4,k} = \Sigma x_{1,k} y_{true,k}$

$a_0 \Sigma x_{2,k} + a_1 \Sigma x_{1,k} x_{2,k} + a_2 \Sigma x_{2,k}^2 + a_3 \Sigma x_{2,k} x_{3,k} + a_4 \Sigma x_{2,k} x_{4,k} = \Sigma x_{2,k} y_{true,k}$

$a_0 \Sigma x_{3,k} + a_1 \Sigma x_{1,k} x_{3,k} + a_2 \Sigma x_{2,k} x_{3,k} + a_3 \Sigma x_{3,k}^2 + a_4 \Sigma x_{4,k} x_{3,k} = \Sigma x_{3,k} y_{true,k}$

$a_0 \Sigma x_{4,k} + a_1 \Sigma x_{1,k} x_{4,k} + a_2 \Sigma x_{2,k} x_{4,k} + a_3 \Sigma x_{3,k} x_{4,k} + a_4 \Sigma x_{4,k}^2 = \Sigma x_{4,k} y_{true,k}$  ”

and insert

$a_0 \Sigma 1 + a_1 \Sigma x_{1,k} + a_2 \Sigma x_{2,k} + a_3 \Sigma x_{3,k} + a_4 \Sigma x_{4,k} = \Sigma y_{true,k}$

$a_0 \Sigma x_{1,k} + a_1 \Sigma x_{1,k}^2 + a_2 \Sigma x_{1,k} x_{2,k} + a_3 \Sigma x_{1,k} x_{3,k} + a_4 \Sigma x_{1,k} x_{4,k} = \Sigma x_{1,k} y_{true,k}$

--  $a_0 \Sigma x_{2,k} + a_1 \Sigma x_{1,k} x_{2,k} + a_2 \Sigma x_{2,k}^2 + a_3 \Sigma x_{2,k} x_{3,k} + a_4 \Sigma x_{2,k} x_{4,k} = \Sigma x_{2,k} y_{true,k}$  --

$a_0 \Sigma x_{3,k} + a_1 \Sigma x_{1,k} x_{3,k} + a_2 \Sigma x_{2,k} x_{3,k} + a_3 \Sigma x_{3,k}^2 + a_4 \Sigma x_{4,k} x_{3,k} = \Sigma x_{3,k} y_{true,k}$

$a_0 \Sigma x_{4,k} + a_1 \Sigma x_{1,k} x_{4,k} + a_2 \Sigma x_{2,k} x_{4,k} + a_3 \Sigma x_{3,k} x_{4,k} + a_4 \Sigma x_{4,k}^2 = \Sigma x_{4,k} y_{true,k}$

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It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

In column 7, line 37,  
 please delete

$$\text{" Estimated Value} = F(f_{\theta}, \theta^{\text{B}}, \theta) \text{ (5) "}$$

please insert --  $Estimated Value = F(f_{\theta}, \tilde{\theta}, \ddot{\theta}) \text{ (5) --.}$

In column 7, line 48,  
 please delete

$$\text{" } P_{estimate} = a_0 + a_1 f_{\theta} + a_2 f_{\theta} \theta^{\text{B}} + a_3 f_{\theta} \theta^{\text{B}} + a_4 \theta^{\text{B}} \theta \text{ (6) "}$$

please insert --  $P_{estimate} = a_0 + a_1 f_{\theta} + a_2 f_{\theta} \tilde{\theta} + a_3 f_{\theta} \ddot{\theta} + a_4 \tilde{\theta} \ddot{\theta} \text{ (6) --.}$

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It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

In column 9, lines 40-61, please delete

" **TABLE 5**

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Various Basis Functions

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Function Number	Basis Function
1	$T_{estimate} = a_0 + a_1 f_\theta + a_2 \tilde{\theta} + a_3 \ddot{\theta}$
2	$T_{estimate} = a_0 + a_1 f_\theta + a_2 \tilde{\theta} + a_3 \ddot{\theta} + a_4 \tilde{\theta}^2$
3	$T_{estimate} = a_0 + a_1 f_\theta + a_2 f_\theta \tilde{\theta} + a_3 f_\theta \ddot{\theta} + a_4 \tilde{\theta} \ddot{\theta}$
4	$T_{estimate} = a_0 + a_1 f_\theta + a_2 f_\theta \tilde{\theta} + a_3 f_\theta \ddot{\theta} + a_4 f_\theta^2 \tilde{\theta} + a_5 f_\theta \tilde{\theta}^2 + a_6 \tilde{\theta} \ddot{\theta}$
5	$T_{estimate} = a_0 + a_1 f_\theta + a_2 \tilde{\theta} + a_3 \ddot{\theta} + a_4 f_\theta^2 + a_5 f_\theta \tilde{\theta}^2 + a_6 \tilde{\theta}^3$
6	$T_{estimate} = a_0 + a_1 f_\theta + a_2 f_\theta \tilde{\theta} + a_3 f_\theta \ddot{\theta} + a_4 \tilde{\theta}^2 + a_5 \tilde{\theta} \ddot{\theta} + a_6 \tilde{\theta}^3$
7	$T_{estimate} = a_0 + a_1 f_\theta + a_2 \tilde{\theta} + a_3 \ddot{\theta} + a_4 f_\theta^2 +$ $a_5 f_\theta \tilde{\theta} + a_6 f_\theta \ddot{\theta} + a_7 \tilde{\theta}^2 + a_8 \tilde{\theta} \ddot{\theta} + a_9 \tilde{\theta}^3$

"

please insert -- Table 5. Various Basis Functions

Function Number	Basis Function
1	$T_{estimate} = a_0 + a_1 f_\theta + a_2 \tilde{\theta} + a_3 \ddot{\theta}$
2	$T_{estimate} = a_0 + a_1 f_\theta + a_2 \tilde{\theta} + a_3 \ddot{\theta} + a_4 \tilde{\theta}^2$
3	$T_{estimate} = a_0 + a_1 f_\theta + a_2 f_\theta \tilde{\theta} + a_3 f_\theta \ddot{\theta} + a_4 \tilde{\theta} \ddot{\theta}$
4	$T_{estimate} = a_0 + a_1 f_\theta + a_2 \tilde{\theta} + a_3 \ddot{\theta} + a_4 f_\theta \tilde{\theta} + a_5 f_\theta \ddot{\theta} + a_6 \tilde{\theta} \ddot{\theta}$
5	$T_{estimate} = a_0 + a_1 f_\theta + a_2 \tilde{\theta} + a_3 \ddot{\theta} + a_4 f_\theta^2 + a_5 \tilde{\theta}^2 + a_6 \tilde{\theta}^3$
6	$T_{estimate} = a_0 + a_1 f_\theta + a_2 f_\theta \tilde{\theta} + a_3 f_\theta \ddot{\theta} + a_4 \tilde{\theta}^2 + a_5 \tilde{\theta} \ddot{\theta} + a_6 \tilde{\theta}^3$
7	$T_{estimate} = a_0 + a_1 f_\theta + a_2 \tilde{\theta} + a_3 \ddot{\theta} + a_4 f_\theta^2$ $+ a_5 f_\theta \tilde{\theta} + a_6 f_\theta \ddot{\theta} + a_7 \tilde{\theta}^2 + a_8 \tilde{\theta} \ddot{\theta} + a_9 \tilde{\theta}^3$

--.

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It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

In column 13, lines 26-44,  
 please delete

TABLE 6

" Various Sub-Basis Functions

Function Number	Sub-Basis Function
1	$a_i = b_{0,i} + b_{1,i} \cdot rpm + b_{2,i} \cdot ltq$
2	$a_i = b_{0,i} + b_{1,i} \cdot rpm + b_{2,i} \cdot ltq + b_{3,i} \cdot rpm \cdot ltq$
3	$a_i = b_{0,i} + b_{1,i} \cdot rpm + b_{2,i} \cdot ltq + b_{3,i} \cdot rpm^2 + b_{4,i} \cdot ltq^2$
4	$a_i = b_{0,i} + b_{1,i} \cdot rpm + b_{2,i} \cdot ltq + b_{3,i} \cdot rpm \cdot ltq + b_{4,i} \cdot rpm^2 + b_{5,i} \cdot ltq^2$
5	$a_i = b_{0,i} + b_{1,i} \cdot rpm + b_{2,i} \cdot ltq + b_{3,i} \cdot rpm \cdot ltq + b_{4,i} \cdot rpm^2 + b_{5,i} \cdot ltq^2 + b_{6,i} \cdot rpm^2 \cdot ltq^2$
6	$a_i = b_{0,i} + b_{1,i} \cdot rpm + b_{2,i} \cdot ltq + b_{3,i} \cdot rpm \cdot ltq + b_{4,i} \cdot rpm^2 + b_{5,i} \cdot ltq^2 + b_{6,i} \cdot rpm^2 \cdot ltq + b_{7,i} \cdot rpm \cdot ltq^2 + b_{8,i} \cdot rpm^2 \cdot ltq^2$
7	$a_i = b_{0,i} + b_{1,i} \cdot rpm + b_{2,i} \cdot ltq + b_{3,i} \cdot \theta_s$
8	$a_i = b_{0,i} + b_{1,i} \cdot rpm + b_{2,i} \cdot ltq + b_{3,i} \cdot \theta_s + b_{4,i} \cdot rpm \cdot \theta_s + b_{5,i} \cdot ltq \cdot \theta_s$
9	$a_i = b_{0,i} + b_{1,i} \cdot rpm + b_{2,i} \cdot ltq + b_{3,i} \cdot \theta_s + b_{4,i} \cdot rpm \cdot \theta_s + b_{5,i} \cdot ltq \cdot \theta_s + b_{6,i} \cdot \theta_s^2 + b_{7,i} \cdot rpm \cdot \theta_s^2 + b_{8,i} \cdot ltq^2 \cdot \theta_s^2$

"

and insert -- Table 6. Various Sub-Basis Functions

Function Number	Sub-Basis Function
1	$a_i = b_{0,i} + b_{1,i} \cdot rpm + b_{2,i} \cdot ltq$
2	$a_i = b_{0,i} + b_{1,i} \cdot rpm + b_{2,i} \cdot ltq + b_{3,i} \cdot rpm \cdot ltq$
3	$a_i = b_{0,i} + b_{1,i} \cdot rpm + b_{2,i} \cdot ltq + b_{3,i} \cdot rpm^2 + b_{4,i} \cdot ltq^2$
4	$a_i = b_{0,i} + b_{1,i} \cdot rpm + b_{2,i} \cdot ltq + b_{3,i} \cdot rpm \cdot ltq + b_{4,i} \cdot rpm^2 + b_{5,i} \cdot ltq^2$
5	$a_i = b_{0,i} + b_{1,i} \cdot rpm + b_{2,i} \cdot ltq + b_{3,i} \cdot rpm \cdot ltq + b_{4,i} \cdot rpm^2 + b_{5,i} \cdot ltq^2 + b_{6,i} \cdot rpm^2 \cdot ltq^2$
6	$a_i = b_{0,i} + b_{1,i} \cdot rpm + b_{2,i} \cdot ltq + b_{3,i} \cdot rpm \cdot ltq + b_{4,i} \cdot rpm^2 + b_{5,i} \cdot ltq^2 + b_{6,i} \cdot rpm^2 \cdot ltq + b_{7,i} \cdot rpm \cdot ltq^2 + b_{8,i} \cdot rpm^2 \cdot ltq^2$
7	$a_i = b_{0,i} + b_{1,i} \cdot rpm + b_{2,i} \cdot ltq + b_{3,i} \cdot \theta_s$
8	$a_i = b_{0,i} + b_{1,i} \cdot rpm + b_{2,i} \cdot ltq + b_{3,i} \cdot \theta_s + b_{4,i} \cdot rpm \cdot \theta_s + b_{5,i} \cdot ltq \cdot \theta_s$
9	$a_i = b_{0,i} + b_{1,i} \cdot rpm + b_{2,i} \cdot ltq + b_{3,i} \cdot \theta_s + b_{4,i} \cdot rpm \cdot \theta_s + b_{5,i} \cdot ltq \cdot \theta_s + b_{6,i} \cdot \theta_s^2 + b_{7,i} \cdot rpm \cdot \theta_s^2 + b_{8,i} \cdot ltq^2 \cdot \theta_s^2$

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In column 13, lines 51-53,  
please delete


$$\epsilon = \min_{b_{ji}} \left( \sum_{i=1}^N (a_{trained,i} - a_{estimated,i})^2 \right) \quad (23)$$

please insert --

$$\epsilon = \min_{b_{j,i}} \left( \sum_{i=1}^N (a_{trained,i} - a_{estimated,i})^2 \right) \quad (23) \quad --$$

Signed and Sealed this

Nineteenth Day of February, 2008



JON W. DUDAS  
*Director of the United States Patent and Trademark Office*